

I claim:

- 1 1. An audio pre-amp and mid-band compressor circuit comprising:
2 a pre-amplifier circuit having a signal input responsive to an input program
3 signal for processing the buffered input program signal to provide a low range band-
4 pass signal, a mid-range band-pass signal and a high range band-pass signal and for
5 adjusting or controlling the relative amplitude of each of the respective low, mid and
6 high range band-pass signals and for summing the amplitude controlled band-pass
7 signals to obtain a compensated signal,
8 a voltage controlled amplifier circuit having a signal input coupled to receive the
9 compensated signal, and a control signal input coupled to receive at least a sample
10 portion of the mid-range band-pass signal, the voltage controlled amplifier circuit being
11 responsive to the sample portion of the mid-range band-pass signal to scale the
12 compensated signal to provide a corrected output signal at an output terminal.
- 1 2. The audio pre-amp and mid-band compressor circuit of claim 1 further
2 comprising:
3 a buffer circuit responsive to the input program signal for buffering the input
4 program signal to provide an unmodified buffered input program signal to the pre-
5 amplifier signal input.
3. The audio pre-amp and mid-band compressor circuit of claim 1 wherein the a
voltage controlled amplifier circuit further comprises:
a buffer circuit responsive to the sample portion of the mid-range band-pass
signal for buffering the sample portion of the mid-range band-pass signal to provide a
buffered sample portion mid-range band-pass signal,
the voltage controlled amplifier circuit being responsive to the sample portion of
the mid-range band-pass signal to scale the compensated signal to provide an output a
corrected output signal.

4. The audio pre-amp and mid-band compressor circuit of claim 1 wherein the voltage controlled amplifier circuit further comprises:

a buffer circuit responsive to the sample portion of the mid-range band-pass signal for buffering the sample portion of the mid-range band-pass signal to provide a buffered sample portion mid-range band-pass signal,

a detector circuit having an input responsive to the buffered mid-range band-pass signal for providing a detected and filtered mid-range band-pass signal,

the voltage controlled amplifier circuit having a voltage controlled amplifier coupled having a control signal input coupled to be responsive to the detected and filtered mid-range band-pass signal scale the compensated signal to provide the corrected output signal.

1 5. The audio pre-amp and mid-band compressor circuit coupled to receive a
2 program signal from a program signal source comprising:

3 a state-variable pre-amplifier responsive to a program input signal to provide a
4 low range band-pass signal, a mid-range band-signal and a high range band-pass signal
5 and for summing and scaling the a low range band-pass signal, a mid-range band-signal
6 and a high range band-pass signal providing a compensated signal,

7 a voltage controlled amplifier circuit having a signal input coupled to receive the
8 compensated signal, and a control signal input coupled to receive at least a sample
9 portion of the mid-range band-pass signal, the voltage controlled amplifier circuit being
10 responsive to the sample portion of the mid-range band-pass signal to scale the
11 compensated signal to provide a corrected output signal characterized to remain within
12 a predetermined linear amplitude range at an output terminal.

6. The audio pre-amp and mid-band compressor circuit of claim 5 wherein the mid-range compensated signal is inverted in phase with respect to the high-frequency compensated signal and the low-range compensated signal components.

1 7. The audio pre-amp and mid-band compressor circuit of claim 5 wherein the
2 voltage controlled amplifier circuit having a signal input coupled to receive the
3 compensated signal, and a control signal input coupled to receive at least a sample
4 portion of the mid-range band-pass signal further comprises:
5 a buffered phase inverter circuit responsive to the sample portion of the mid-
6 range band-pass signal to provide a buffered sample portion of the mid-range band-pass
7 signal,
8 a detector circuit responsive to the buffered sample portion of the mid-range
9 band-pass signal to provide a detected sample portion of the mid-range band-pass
10 signal,
11 a filter for filtering the detected sample portion of the mid-range band-pass
12 signal to provide a detected and filtered sample portion of the mid-range band-pass
13 signal,
14 a voltage controlled amplifier and buffer circuit having a signal input coupled to be
15 responsive to the compensated signal and a control signal input coupled to be
16 responsive to the detected and filtered sample portion of the mid-range band-pass
17 signal, the voltage control amplifier circuit being characterized to scale the amplitude of
18 the compensated signal in response to the detected and filtered sample portion of the
19 mid-range band-pass signal to provide a corrected output signal that remains within a
20 predetermined linear amplitude range at an output terminal.

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8. The audio pre-amp and mid-band compressor circuit of claim 5 wherein the
mid-range compensated signal is inverted in phase with respect to the high-frequency
compensated signal and the low-range compensated signal components.

1 9. The audio pre-amp and mid-band compressor circuit coupled to receive a
2 program signal from a program signal source comprising:
3 a state-variable pre-amplifier responsive to a program input signal to provide a
4 low range band-pass signal, a mid-range band-signal and a high range band-pass signal
5 and for summing and scaling a low range band-pass signal, a mid-range band-signal and
6 a high range band-pass signal providing a compensated signal, and
7 a voltage controlled amplifier circuit having a signal input coupled to receive the
8 compensated signal, and a control signal input coupled to receive at least a sample
9 portion of the mid-range band-pass signal, the voltage controlled amplifier further
10 circuit comprising:
11 a buffered phase inverter circuit responsive to the sample portion of the mid-
12 range band-pass signal to provide a buffered sample portion of the mid-range band-pass
13 signal,
14 a detector circuit responsive to the buffered sample portion of the mid-range
15 band-pass signal to provide a detected buffered sample portion of the mid-range band-
16 pass signal,
17 a filter for filtering the detected buffered sample portion of the mid-range band-
18 pass signal to provide a detected and filtered buffered sample portion of the mid-range
19 band-pass signal,
20 a voltage controlled amplifier and buffer component (a VCA) having a signal
21 input coupled to be responsive to the compensated signal and a control signal input
22 coupled to be responsive to the detected and filtered buffered sample portion of the mid-
23 range band-pass signal, the voltage control amplifier component being characterized to
24 scale the amplitude of the compensated signal in response to the detected and filtered
25 buffered sample portion of the mid-range band-pass signal to provide a corrected output
26 signal that remains within a predetermined linear amplitude range at an output terminal.